Volcanic and Magmatic Studies Group

December 2018 Newsletter (No. 41)

December VMSG newsletter

Welcome to the fourth and final instalment of the VMSG quarterly newsletter for 2018. This issue should be my last in charge of the newsletter with another of the committee taking the newsletter forward as I rotate off at the January meeting. It has been a fun and interesting experience keeping up to date with the community activities and I hope the content keeps coming in strong going forward! On that note, I extend a final thankyou to all those who have made the effort to send in material to keep the newsletter going! Moving on, in this issue we have the latest impact in focus article from Jenni Barclay, the announcement of LASI 6 to be hosted in Argentina next year, student bursary reports and a number of session announcements.

St Andrews VMSG 2019

As you will all be aware, the 2019 VMSG annual conference will be hosted by St Andrews university between the 7-10th of January. The full schedule and information about the event can be found at the following link on the dedicated webpages set up by the local organising committee. With over 170 delegates registered for the conference, over 140 abstracts, several exciting keynotes and the promise of a warm Scottish welcome in the historic university town of St Andrews, this year promises to be a great event and one not to miss!

Announcement of LASI 6 conference – The physical geology of subvolcanic systems: laccoliths, sills and dykes

Sent in by Olivier Galland

We are pleased to announce the 6th event of the LASI (The physical Geology of subvolcanic systems: laccoliths, sills and dykes) meeting. It will take place in Malargüe, Argentina, on the 25th-29th November 2019. Since 2002, the open LASI community gathers scientists interested in shallow-level igneous intrusions. Five international conferences have been held since then, each with 40-50 participants from 10-17 countries, presenting papers and attending a field trip to spectacular intrusive complexes. The conferences put in evidence the vitality of this research community as well as the relevance of the topic to societal needs such as hydrocarbon and ore mineral exploration, natural hazards, and climate change.

The 2-day conference will be followed by a field trip in the outstanding nature and geology of the Neuquén Basin. The Neuquén Basin is one of the main hydrocarbon producer basins in South America. During the Tertiary, numerous igneous episodes lead to the emplacement of voluminous sill, laccolith and dyke complexes in the sedimentary formations of the basin. During the field trip, we will visit well-exposed sills and fingers, where their deformed sedimentary host rock is exceptionally well preserved. In addition, we will also visit producing hydrocarbon fields hosted in igneous sills, and other outstanding geological sites. After working many years in the Neuquén Basin, the area has been demonstrated to provide truly world-class exposures of subvolcanic intrusive complexes which are leading to many exciting new insights into magma plumbing systems and their interactions with petroleum systems in the sub-surface. For more information and updates visit link and we hope you can join the meeting next year!

Fieldwork in the Neuquén Basin, Argentina

Impact in Focus

Impact in focus this issue comes from **Prof. Jenni Barclay** of the University of East Anglia who has chosen a classic volcanology paper by fellow VMSG member Sir Steve Sparks which includes insights into bubble formation and growth and their importance in magmas.

Citation: Sparks, S. (1978). The dynamics of bubble formation and growth in magmas: a review and analysis, JVGR, 3, 1-37.

Recommendation:

My first degree at the University of Edinburgh created a lifelong fascination with rocks whether in the field, lab or just distracting me on the mantelpiece. But this paper opened up a doorway for me into the magical palace of treasures that is the application of physical principles to volcanological problems.

My science career is not quite as old as this paper, but Steve came to Edinburgh in the early 90s to talk about tephra dispersal, and I was so taken with his approach to volcanology I wrote and asked if he had any PhDs on offer. Yes! Readers! In the olden days PhDs were advertised on noticeboards and we all wrote letters to each other! Steve sent me this paper and description of the PhD, that I went on to do, even though I'd never come across his work before.

At its heart, this paper is a review of the state of the art of knowledge of the physics and chemistry of bubble growth in viscous liquids, and the application of this knowledge to understand bubble growth in volcanic systems, under conditions of eruption.

Although some of the ideas have now been surpassed, re-reading it again it's littered with little research avenues that have been followed for decades. On Google Scholar it has some 904 citations; 44 of which were this year!

Most importantly though, for me, its an enduring testimony to the power of reading widely and reading outside your field. To try and understand bubbles, and fill the gaps in the volcanological

literature Steve rode in the seas of engineering, ceramics, applied physics and metallurgy and plundered their experimental and theoretical results for relevant information. For those of you currently struggling with literature reviews it's a reminder to (try to) treasure the time to read and think, and follow your interests as widely as they zig-zag as you try to solve a problem. For myself, it's a reminder of the power of thinking and looking beyond the obvious and to never forget to look carefully for things people have already discovered elsewhere.

EGU General Assembly Sessions, Vienna, Austria, 7–12 April 2019

Sent in by Jennifer Woods

I'd just like to make you aware of the session I am convening at the EGU general assembly 2019 (abstract submission now open, deadline 10 Jan) with Bob White and David Neave. We're hoping to bring together a diverse group of researchers for a really productive, multidisciplinary session, and would welcome your contributions.

Magma transport in the crust: dykes and sills - GMPV5.6/SM6.8

https://meetingorganizer.copernicus.org/EGU2019/session/32728

We invite multidisciplinary contributions - both observational (seismology, geodetics, geobarometry etc.) and modelling (computational, analogue etc.) - on magma transport in the crust through dykes and sills. Understanding dykes and sills is vital as they serve both as the conduits that feed eruptions (and must be monitored to evaluate volcanic hazards), and as the bodies that build the crust. Although considerable uncertainties in our understanding of magma plumbing systems remain, recent events in Iceland (2014 Bárðarbunga-Holuhraun rifting event) have demonstrated how progress can be made by combining diverse observations from traditionally distinct disciplines.

See you in Vienna!

Sent in by Philip Ball

Rifted margins: Geological and geophysical observations, interpretations and their uncertainty with respect to the understanding of their evolutions and architectures (co-organized)

https://meetingorganizer.copernicus.org/EGU2019/session/32434

Convener: Philip Ball
Co-conveners: Laurent Gernigon , Geoffroy Mohn, Charlotte NIELSEN , Jean-Claude Ringenbach

The integrated study of field (young, and ancient analogues preserved in orogenic systems), seismic reflection/refraction, gravity/magnetics, well data (exploration and IODP), analogue and thermo-mechanical modelling approaches have greatly improved our understanding of the processes that influence and modify the architecture (crustal, magmatic, sedimentary, structural and thermal) of the distal domain of rifted margins. As more data becomes available our appreciation of the 3D and ultimately 4D geodynamic processes that influence the formation and present day structure of distal margins is evolving. Although all rifted margins are somewhat unique, similar genetic processes are often proposed despite the underlying interpretational uncertainties. These uncertainties can impact the resulting interpretations relating to the tectono-magmatic and crustal models. Therefore, despite many models the process often remains controversial and/or far for being well constrained.

This session would like to explore and discuss the observations and interpretations derived from geological and geophysical datasets across rifted margins and distal margins. Importantly, uncertainties should be addressed with respect to our current understanding of the genetic rift-domain evolution. Observations should focus on the evidences for processes that impact the final architecture, rock content and thermal imprint of conjugate margins. This relates to the observed style of extension and thinning (high vs low angle faulting and static vs dynamic interpretations and their evidence), vertical motions (e.g. uplift and subsidence), the isostatic impacts of the tectonic, magmatic and stratigraphic history relating to the genetic-rift domains.

Student Bursary Reports

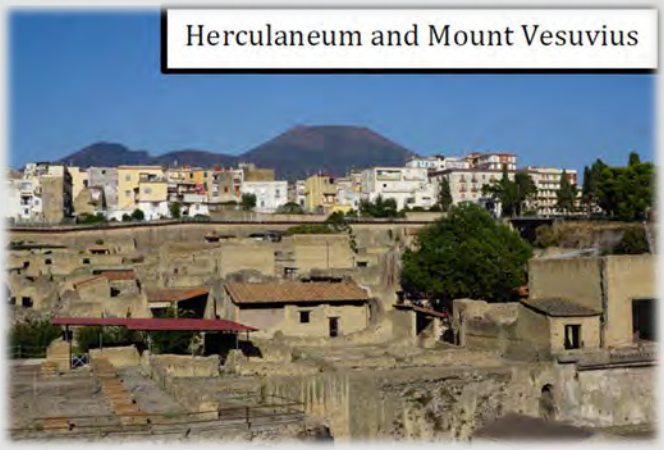
Within this section, we have a number of short reports sent in by PhD students who received VMSG bursary funding to attend conferences. Well done to all presenters!

Cities on Volcanoes 10, Naples, Italy, (2-7 September, 2018)

Attendee: Danielle McLean

Affiliation: University of Oxford

Constraining the tempo and frequency of eruptions that dispersed ash over central Honshu (Japan) between 30 and 50 ka



Generous funding support from the VMSG meant I was able to attend and present some of my final D.Phil. results as an oral presentation at the Cites on Volcanoes 10 meeting, held in Naples (2nd – 7th Sep.). In this talk I outlined how identifying cryptotephra (non-visible ash) layers through the high-resolution sediments of Lake Suigetsu (central Honshu, Japan) has enabled a new understanding of the tempo and frequency of East Asian eruptions between 50 and 30 ka. The Suigetsu sediments contain five times more cryptotephra layers through the sequence, which we can correlate using their glass geochemistry to major sources in the south, on Kyushu island. The intensely dated Lake Suigetsu sediments mean that we can provide very constrained eruption ages for these large magnitude events. I received some very useful feedback, new ideas for further work and particularly, ways to better understand the magnitude of these events. I was also able to network with international colleagues and exchange ideas with other scientists and policy makers.

The conference took place inside the Campi Flegrei caldera Red Zone and at the foot of the western slopes of Somma-Vesuvius. As part of the conference we were privileged to visit the Vesuvius Observatory, which is one of the oldest in the world and we were able to witness live eruptions from Stromboli from the monitoring infrared cameras. I participated in an intraconference fieldtrip to the crater of Vesuvius and was able to observe vent structure and eruption stratigraphy. We also visited the excavation site of Herculaneum at the base of Vesuvius, which has been exceptionally well preserved following the devastating AD 79 eruption. The conference has given me lots of extra motivation for my final D.Phil. write-up.

Attendee: Amelia Bain

Affiliation: University of Edinburgh

Micro-textural and rheological controls on vulcanian eruption cyclicity

I am very grateful to have been awarded a VMSG travel bursary to attend the Cities on Volcanoes 2018 conference in Naples, Italy. This bursary allowed me

to contribute an oral presentation of the most recent results of my PhD work, "Micro-textural and rheological controls on vulcanian eruption cyclicity", to the session "Investigating eruption triggers and dynamic processes in magmas". I have subsequently been approached by potential collaborators working in Italy as a direct result of this presentation, so the support of VMSG may lead to some interesting future research directions.

I very much enjoyed attending my first Cities on Volcanoes conference. I attended a very satisfying mix of applied volcanology research presentations and had the opportunity to meet people working on topics that I would not have at a conference more focussed on physical science research. I also re-connected with previous collaborators and co-authors and made new friends.

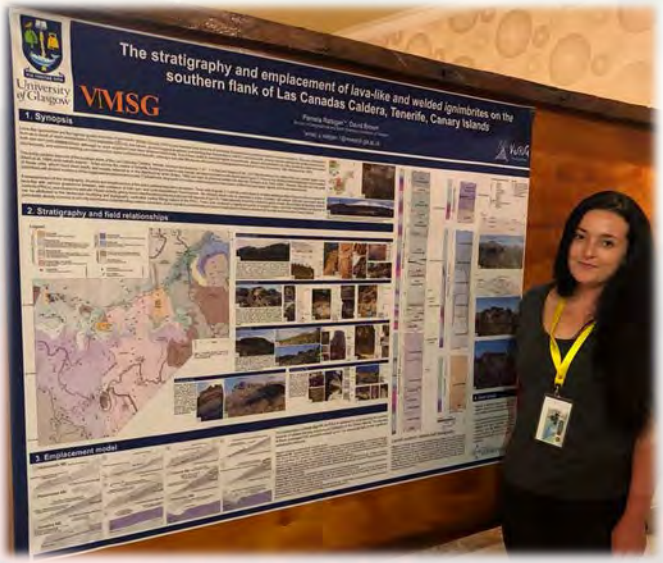
There were many highlights of the trip, including a fieldtrip to Campi Flegrei, where I was able to appreciate the magnitude of the dilemma of monitoring and planning a potential evacuation for such a densely populated area. I attended an early career workshop focussing on communication between scientists and stakeholders, which included a panel discussion and a role-playing exercise involving different groups of stakeholders. This workshop was very helpful in raising awareness of the needs of different groups of people during volcanic crises, and the necessity to build relationships between the different agents prior to crisis time.

I ended the trip with a more touristic visit to Pompeii with other ECRs, which was a nice way to mark handing in my thesis the week before. However, we were all affected by the observation that many houses in Pompeii used ignimbrite blocks as building stone, leading us to reflect on the ongoing challenges facing our colleagues monitoring the volcanoes and studying past activity in the Naples area.

IAVCEI VII International Workshop on Collapse Calderas, Samosir, North Sumatra, (21-27, September, 2018)

Attendee: Pamela Rattigan

Affiliation: University of Glasgow



The stratigraphy and emplacement of lava-like and welded ignimbrites on the southern flank of Las Canadas Caldera, Tenerife, Canary Islands

With the help of a VMSG student bursary, this September I attended the IAVCEI 7th International Workshop on Collapse Calderas (VII IWCC) held in Tuktuk, Samosir, an island situated within Lake Toba, North Sumatra, Indonesia. The workshop provided an excellent platform to discuss my research at a focussed, subject-specific meeting and to expand my understanding of caldera systems from a broad range of perspectives: the physical settings of calderas; magmatic processes; eruption dynamics; and the hazards and impacts of eruptions. The meeting consisted of two days of lectures, presentations and discussion and three days of field-based discussion at various sites around Toba caldera and Samosir island, investigating the deposits of caldera-forming super eruptions and the resurgence of Toba caldera. I was also fortunate enough to attend the post-workshop excursion to Sinabung Volcano Observatory and field visit to observe the recent 2013 - 2015 PDC and lahar deposits.

I presented a poster and short talk titled 'The stratigraphy and emplacement of lava-like and welded ignimbrites on the southern flank of Las Cañadas Caldera, Tenerife, Canary Islands' which outlined some of the key findings of my field seasons. My project is an investigation into the emplacement, deformation (syn- and post-depositional) and crystallisation phases of welded and lava-like ignimbrites, and the factors controlling these processes. I not only benefitted from the feedback

from my presentation and from discussion with others looking at similar processes, but learnt a great deal from the wider discussion and exchanges following the sessions. Connecting with the Commission on Caldera Collapse ECR network was also very useful at this stage of my project, in terms of careers advice, opportunities and tips for writing up, and the opportunity to get to know others in my field, something which can be difficult at larger scale conferences and meetings.

A huge thanks to the VMSG committee and community for providing the support to attend such a valuable workshop.

Toba Caldera

Notices

GDPR

The Volcanic and Magmatic Studies Group (VMSG) is a joint special interest group of the Geological Society of London and the Mineralogical Society, and gathers personal information about members in order to provide you with services relating to our activities (conferences, bursaries, fieldtrips etc). These data will be stored electronically by VMSG for a period of not more than three years. They will be used to contact you in relation to that event/product in which you expressed interest only. After the 3-year period has expired, the data will be archived on paper to a secure location at the Mineralogical Society's premises. Individuals can ask at any time to see stored records and to have them amended or to have them deleted permanently.

Fieldtrip Co-ordinator:

If you are interested in running a VMSG fieldtrip, please contact any member of the current committee and we will coordinate from there. These are great opportunities to get the community together so if you are interested in getting one off the ground please do get in touch!

Upcoming awards of relevance to the VMSG community:

Do you know an outstanding member of the VMSG community? Please consider nominating them for awards and medals bestowed by other societies. Remember, these recognise both early career scientists as well as those well established.

PhD studentships:

We are collating all VMSG-related PhD studentships for dissemination. Please circulate to interested undergraduate students and others. If you want your PhD to be on the list, please let our student representative know. http://www.vmsg.org.uk/students/phd.php

VMSG Distribution List

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VMSG can also be found on Twitter, Facebook and LinkedIn.

Sami Mikhail (sm342@st-andrews.ac.uk) runs the VMSG twitter account with a great range of links to papers, positions, articles/news of interest being updated on a regular basis so do follow!!

How to join or leave the group?

Go to the group homepage at www.jiscmail.ac.uk/vmsg and choose the 'Subscribe or Unsubscribe' link from that page. You will receive a confirmation email which you need to respond to.

Editorial

Many thanks again to those who have contributed to this issue. Details of the next newsletter and the new contact point will be sent out in the new year.